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10/600,169	06/19/2003	Dong Pil Park	DAE-0007	7167

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EXAMINER
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LEWIS, BEN

ART UNIT	PAPER NUMBER
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1745

DATE MAILED: 03/23/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/600,169

Applicant(s)

PARK, DONG PIL

Examiner

Ben Lewis

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-17 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-17 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 19 June 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

## Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

## Attachment(s)

- ☒ Notice of References Cited (PTO-892)
- ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)  
Paper No(s)/Mail Date 3/19/03.
- ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_.
- ☐ Notice of Informal Patent Application (PTO-152)
- ☐ Other: \_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 102*

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-5 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami et al. (U.S. Patent No. 6,329,101 B1).

With respect to claim 1, Kawakami teach a method for manufacturing a powdery material electrode member for a secondary cell wherein the hydrogen-storing compound powder obtained in Example 4 was mixed with 2 weight ratio of flake-like nickel coated graphite powder, 85 um in average particle size, 1 weight ratio of spherical nickel powder, 10 um in average particle size as the auxiliary conductive materials, and 3% by weight of polyvinyl alcohol on the compound powder basis under the addition of water to prepare a pasty mixture and the mixture was filled in a spongy nickel porous member "current collector" having a porosity of 95% and an average pore size of 150 um. After drying, the filled member was pressurized by using a roller press and cut to a predetermined size. To the cut member, a nickel lead wire was connected and an electrode member serving as the negative electrode of a secondary cell was obtained (Col 27 lines 55-67).

With respect to claim 2, Kawakami teach a that the above-mentioned hydrogen-storing (alloy) powder also comprises the transition metal oxide layer composed of one transition metal element or more selected from molybdenum, tungsten, vanadium, niobium, titanium, zirconium and iridium, and oxygen element formed outside the core layer for storing hydrogen and one transition metal or more selected from nickel, chromium, molybdenum, cobalt, copper, palladium, platinum, iron, ruthenium, rhodium, iridium, tungsten, titanium and manganese dispersed outside the transition metal oxide layer (Col 13 lines 14-25).

With respect to claim 3, Kawakami teach in Example 4 that the hydrogen-storing alloy of the above coated with lithium-contained tungsten-silicon oxide containing lithium element and having metallic nickel, cobalt and copper dispersed and carried on the outermost surface in a thickness of about 10 nm (Col 26 lines 35-56). The hydrogen-storing compound powder obtained in Example 4 was mixed was filled in a spongy nickel porous member "collector" having a porosity of 95% and an average pore size of 150  $\mu\text{m}$  (Col 27 lines 55-67).

With respect to claim 4, Kawakami teach that a group of electrodes were produced by winding the positive electrode obtained in Example 16 and the negative electrode obtained in Comparative Example 1 via an interposed separator in a

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cylindrical spiral shape (Col 34 lines 33-45). Therefore the collectors must be in strip form in order to be wound into a cylindrical spiral shape.

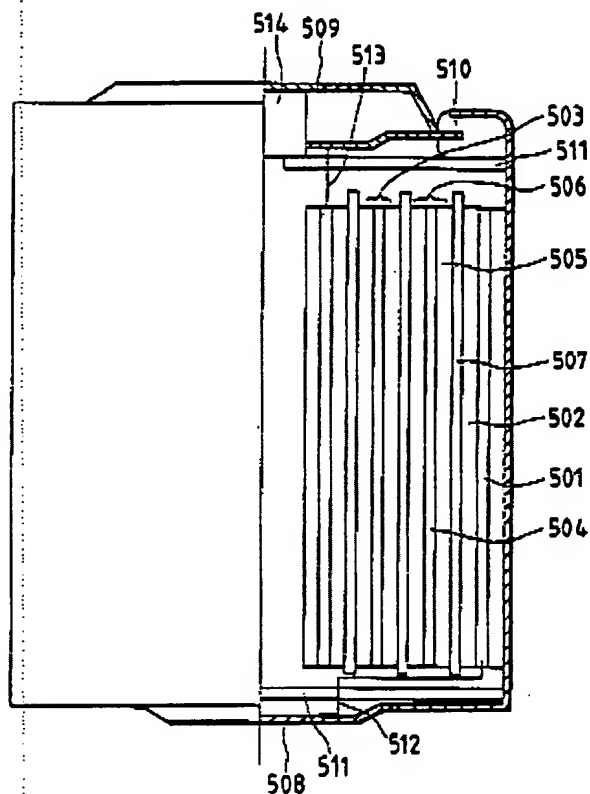
With respect to claim 5, Kawakami teaches that as the preparation of an electrode member electrode, e.g., having the structure shown in FIG. 2, by using a powdery material comprising the above hydrogen-storing compound, two roughly classified methods can be employed: one by adding a auxiliary conductive material to the powdery material and sintering the mixture on a collector or the other by having the powdery material bounded on a collector with a binding agent. As the above collector, a foamed metal obtained by coating the surface of a sheet-shaped polymer resin having a three dimensional network structure of foamed urethane or the like with a metal film of nickel or the like by the plating or other techniques and by the decomposing removal of the resin through firing, a foamed metal obtained by coating a felt of carbon fiber with a metal film of nickel or the like by the plating or other techniques, a non-woven cloth of a metal fiber such as nickel fiber, a sintered product of nickel fine powder, a punching metal or expanded metal of nickel or a nickel-plated perforated thin copper sheet, a nickel foil, a nickel-plated metal foil and such others are employed (Col 17 lines 11-35).

3. Claims 6-9 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami et al. (U.S. Patent No. 6,329,101 B1).

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With respect to claim 6, Kawakami teach a method for manufacturing a powdery material electrode member for a secondary cell wherein the hydrogen-storing compound powder obtained in Example 4 was mixed with 2 weight ratio of flake-like nickel coated graphite powder, 85 um in average particle size, 1 weight ratio of spherical nickel powder, 10 um in average particle size as the auxiliary conductive materials, and 3% by weight of polyvinyl alcohol on the compound powder basis under the addition of water to prepare a pasty mixture and the mixture was filled in a spongy nickel porous member "current collector" having a porosity of 95% and an average pore size of 150 um. After drying, the filled member was pressurized by using a roller press and cut to a predetermined size. To the cut member, a nickel lead wire was connected and an electrode member serving as the negative electrode of a secondary cell was obtained (Col 27 lines 55-67). In FIGS. 6, 7 and 8, Numerals **401**, **503** and **601** denote negative electrodes comprising a negative electrode active material layer. Numerals **501** and **600** denote negative electrode collectors (Col 21 lines 14-67). In Fig. 7 the negative electrodes **503** which comprise nickel strips are facing each other.

*FIG. 7*



With respect to claim 7, Kawakami teach a that the above-mentioned hydrogen-storing (alloy) powder also comprises the transition metal oxide layer composed of one transition metal element or more selected from molybdenum, tungsten, vanadium, niobium, titanium, zirconium and iridium, and oxygen element formed outside the core layer for storing hydrogen and one transition metal or more selected from nickel, chromium, molybdenum, cobalt, copper, palladium, platinum, iron, ruthenium, rhodium, iridium, tungsten, titanium and manganese dispersed outside the transition metal oxide layer (Col 3 lines 14-25).

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With respect to claim 8, Kawakami teach a that the negative electrode **503** is connected via a negative electrode lead wire **512** to the negative electrode can **508**, whereas the positive electrode **506** is connected via a positive electrode lead wire **513** to the positive electrode cap **509** (Col 21 lines 14-67) (See Fig. 7). Fig. 7 shows that the leads are connected at the upper and lower edges of the collectors.

With respect to claim 9, Kawakami teach a that As hydrogen-storing alloy powder to be used for the core portion of a powdery material comprising a hydrogen-storing compound according to the present invention, the multi-component ones obtained by the partial substitution of Ni of the  $MmNi_5$  "AB<sub>5</sub>" hydrogen storing alloy (Mm: Mischmetal) with Mn, Al and Co, transition metal hydrogen-storing alloys of multi-component alloys of Zr, Ti, V, Ni, Mn, Co, Fe and the like, magnesium-nickel alloys, or the like may be included.

4. Claims 10-12 and 14-17 are rejected under 35 U.S.C. 102(b) as being anticipated by Kawakami et al. (U.S. Patent No. 6,329,101 B1).

With respect to claim 6, Kawakami teach a method for manufacturing a powdery material electrode member for a secondary cell wherein in FIGS. 6, 7 and 8, Numerals **401**, **503** and **601** denote negative electrodes comprising a negative electrode active material layer Numerals **403**, **506** and **603** denote positive electrodes comprising a



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positive electrode active material layer; Numerals **405**, **508** and **605** denote negative electrode terminals (negative electrode caps or negative electrode cans); Numerals **406**, **509** and **606** denote positive electrode terminals (positive electrode caps or positive electrode cans); Numerals **407**, **507** and **607** denote separators. electrolytes; Numerals **410** and **510** denote gaskets; Numerals **501** and **600** denote negative electrode collectors; Numerals **504** and **511** denote a positive electrode collector and an insulating plate; Numerals **512** and **513** denote a negative electrode lead wire and a positive electrode wire; Numerals **514** and **614** denote safety valves; and Numeral **609** denotes a battery housing (battery jar). With the flat (coin-shaped) secondary cell shown in FIG. 6, a positive electrode **403** comprising a positive electrode active material (active material layer) and a negative electrode **401** comprising a negative electrode active material (active material layer) is stacked at least via a separator **407** retaining an electrolyte (electrolyte solution), this stack is housed in a positive electrode can **406** as the positive electrode terminal from the positive electrode side and the negative electrode side is coated with a negative electrode cap **405** as the negative electrode terminal. (Col 21 lines 14-67) (See Figs. 6,7 and 8).

With respect to claim 11, Kawakami teach a that the negative electrode **503** is connected via a negative electrode lead wire **512** to the negative electrode can **508**, whereas the positive electrode **506** is connected via a positive electrode lead wire **513** to the positive electrode cap **509** (Col 21 lines 14-67) (See Fig. 7). Fig. 7 shows that the negative electrodes **503** face each other. Regarding metal hydride contained

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between the electric collectors, Kawakami teaches that as the preparation of an electrode member electrode, e.g., having the structure shown in FIG. 2, by using a powdery material comprising the above hydrogen-storing compound, two roughly classified methods can be employed: one by adding a auxiliary conductive material to the powdery material and sintering the mixture on a collector or the other by having the powdery material bounded on a collector with a binding agent. As the above collector, a foamed metal obtained by coating the surface of a sheet-shaped polymer resin having a three dimensional network structure of foamed urethane or the like with a metal film of nickel or the like by the plating or other techniques and by the decomposing removal of the resin through firing, a foamed metal obtained by coating a felt of carbon fiber with a metal film of nickel or the like by the plating or other techniques, a non-woven cloth of a metal fiber such as nickel fiber, a sintered product of nickel fine powder, a punching metal or expanded metal of nickel or a nickel-plated perforated thin copper sheet, a nickel foil, a nickel-plated metal foil and such others are employed (Col 17 lines 11-35).

With respect to claim 12, Kawakami teaches that as the preparation of an electrode member electrode, e.g., having the structure shown in FIG. 2, by using a powdery material comprising the above hydrogen-storing compound, two roughly classified methods can be employed: one by adding a auxiliary conductive material to the powdery material and sintering the mixture on a collector or the other by having the powdery material bounded on a collector with a binding agent. As the above collector,

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a foamed metal obtained by coating the surface of a sheet-shaped polymer resin having a three dimensional network structure of foamed urethane or the like with a metal film of nickel or the like by the plating or other techniques and by the decomposing removal of the resin through firing, a foamed metal obtained by coating a felt of carbon fiber with a metal film of nickel or the like by the plating or other techniques, a non-woven cloth of a metal fiber such as nickel fiber, a sintered product of nickel fine powder, a punching metal or expanded metal of nickel or a nickel-plated perforated thin copper sheet, a nickel foil, a nickel-plated metal foil and such others are employed (Col 17 lines 11-35).

With respect to claim 14, Kawakami teach that a group of electrodes were produced by winding the positive electrode obtained in Example 16 and the negative electrode obtained in Comparative Example 1 via an interposed separator in a cylindrical spiral shape (Col 34 lines 33-45). Therefore the collectors must be in strip form in order to be wound into a cylindrical spiral shape.

With respect to claim 15, Kawakami teach a that the negative electrode **503** is connected via a negative electrode lead wire **512** to the negative electrode can **508**, whereas the positive electrode **506** is connected via a positive electrode lead wire **513** to the positive electrode cap **509** (Col 21 lines 14-67) (See Fig. 7). Fig. 7 shows that the leads are connected at the upper and lower edges of the collectors.

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With respect to claims 16 and 17, Kawakami teach a that the above-mentioned hydrogen-storing (alloy) powder also comprises the transition metal oxide layer composed of one transition metal element or more selected from molybdenum, tungsten, vanadium, niobium, titanium, zirconium and iridium, and oxygen element formed outside the core layer for storing hydrogen and one transition metal or more selected from nickel, chromium, molybdenum, cobalt, copper, palladium, platinum, iron, ruthenium, rhodium, iridium, tungsten, titanium and manganese dispersed outside the transition metal oxide layer (Col 13 lines 14-25).

5. Claim 1 is rejected under 35 U.S.C. 102(b) as being anticipated Yun et al. (U.S. Patent No. 5,682,592).

With respect to claim 1, Yun et al. disclose a fabrication method for paste-type metal hydride electrode wherein the present invention relates to a fabrication method for a paste-type metal hydride electrode for a nickel/metal hydride battery, and more particularly to an desired fabrication method for a paste-type metal hydride electrode for a nickel/metal hydride battery which is capable of enhancing an electrode capacity and processing ability by fabricating the paste-type metal hydride electrode by filling in a porous nickel "perforated collector", drying, coating and press-forming after mixing a hydrogen storage alloy powder with an undiluted paste solution, and of improving a stability and a cycle life of an electrode by preventing the detachment of electrode active material by micronizing of hydrogen storage alloy. The conventional fabrication method of a metal hydride electrode employs two fabrication methods. One fabrication

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method of a press-type electrode is by press-forming and then sintering a V-Ti-Zr-Ni-type alloy powder "metal powder" which is mainly used by the OBC corporation in the United States of America (Col 2 lines 20-67).

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Kawakami et al. (U.S. Patent No. 6,329,101 B1) as applied to claims 10-12 and 14-17 above and further in view of Nakamaru et al. (U.S. Patent No. 6,013,389).

With respect to claim 13, Kawakami teach a method for manufacturing a powdery material electrode member for a secondary cell in paragraph 4 above. Kawakami et al do not specifically teach wherein the electric collectors are made of nickel plated iron. However, Nakamaru et al. disclose a cylindrical storage battery wherein a nickel-plated iron plate about 0.08 mm in thickness was used as the perforation sheet 3 of the positive electrode and a nickel-plated iron plate about 0.06 mm in thickness was used as the perforation sheet 4 of the negative electrode plate, respectively (Col 4 lines 44-

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67).. Therefore it would have been obvious to one of ordinary skill in the art to use the nickel plated iron collector of Nakamaru et al. in the battery of Kawakami et al because Nakamaru et al. teach that a nickel-plated iron plate about 0.06 mm in thickness was used as the perforation sheet 4 of the negative electrode plate in consideration of the easiness of bending in coiling spirally the electrode plates and the secureness (Col 4 lines 44-67).

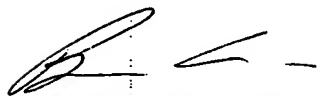
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Ben Lewis whose telephone number is 571-272-6481. The examiner can normally be reached on 8:30am - 5:30pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Patrick Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

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Ben Lewis



Patent Examiner  
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PATRICK JOSEPH RYAN  
SUPERVISORY PATENT EXAMINER